

PATENT ABSTRACTS OF JAPAN

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(54) DATA TRANSMISSION METHOD, DATA TRANSMITTER, DATA
REPRODUCTION METHOD AND REPRODUCING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a data transmitter that transmits contents data adopting a multi-media coding form such as the MPEG-4 in a way that the contents data can surely be reproduced in a network environment where a transmission error may take place.

SOLUTION: The data transmitter 101 for contents data of the multi-media coding form is characterized in that the transmitter 101 detects scheduled update contents from scene information of the contents data, generates update notice information to inform of updated scenes, and uses a transmission channel 103 to transmit the update notice information to a reproducing device 102 before occurrence of the update.

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CLAIMS

[Claim(s)]

[Claim 1] The data-transmission approach which carries out [detecting the contents of updating which are the data-transmission approaches of the contents data encoded in the multimedia coding format including the scene information for controlling a scene configuration, and are planned from said scene information, generating the notice information of updating which shows renewal of a scene, and transmitting said notice information of updating to an external device before updating generating of a scene, and] as the description.

[Claim 2] The data transmission approach according to claim 1 characterized by transmitting the updating scene information corresponding to the notice information of updating to said external device before updating generating of a scene.

[Claim 3] The data transmission approach according to claim 2 characterized by being transmitted by different transmission system from said notice information of updating, and said updating scene information.

[Claim 4] Said updating scene information is the data transmission approach

according to claim 3 characterized by being transmitted with the transmission system with which transmission of data is guaranteed.

[Claim 5] The data transmission approach given in claim 2 characterized by extracting the generating time of day of updating planned from said scene information, and computing the transmission start time of said notice information of updating, and said updating scene information based on said updating generating time of day thru/or any 1 term of 4.

[Claim 6] The data transmission approach given in including [the updating assignment information that the purport which updating produces is specified as the data created as said notice information of updating] claim 1 thru/or any 1 term of 5.

[Claim 7] The data transmission approach given in claim 2 by which the auxiliary data with which specification of said updating scene information data or acquisition of said updating scene information data is assisted is contained in the data created as said notice information of updating thru/or any 1 term of 5.

[Claim 8] The data transmission approach given in claim 1 characterized by the data in which the same contents are shown in preparation for a data deficit at the time of sending out of said notice information of updating carrying out

multiple-times transmission thru/or any 1 term of 7.

[Claim 9] The data transmission approach given in claim 1 characterized by transmitting instantly immediately after editing the scene information on said contents data thru/or any 1 term of 8.

[Claim 10] The data transmission unit carry out having a generation means is the data transmission unit of the contents data of a multimedia coding format including the scene information for controlling the configuration of a scene, and generate the notice information of updating for detecting the contents of updating which analyze said scene information and are planned, and notifying that renewal of a scene is the input means of said scene information, and a transmission means transmit said notice information of updating to an external device before updating generating of a scene as the description.

[Claim 11] The data transmission unit according to claim 10 characterized by having a means to transmit the updating scene information corresponding to said notice information of updating to said external device before updating generating of a scene.

[Claim 12] The data transmission unit according to claim 11 characterized by being transmitted by different transmission system from said notice information

of updating, and said updating scene information.

[Claim 13] Said updating scene information is a data transmission unit according to claim 12 characterized by being transmitted with the transmission system with which transmission of data is guaranteed.

[Claim 14] A data transmission unit given in claim 11 characterized by extracting the generating time of day of updating planned from said scene information, having a means to compute the transmission start time of said notice information of updating, and said updating scene information based on said updating generating time of day, and transmitting the data concerned at the time of arrival of transmission initiation processing time of day thru/or any 1 term of 13.

[Claim 15] A data transmission unit given in claim 11 characterized by having a means to associate and manage said notice information of updating, and said updating scene information, and transmitting the updating scene information concerned to a demand of the updating scene information corresponding to the notice information of updating thru/or any 1 term of 13.

[Claim 16] A data transmission unit given in claim 10 characterized by having a means to transmit the media data which constitute said contents data thru/or any 1 term of 16.

[Claim 17] The playback approach characterized by to receive the media data which are the playback approach of the contents data encoded in a multimedia coding format including the scene information for controlling the configuration of a scene, and constitute said contents data, and for a transmission system different from said media data to receive the updating scene information which shows the scene information by which said contents data were updated, and to reproduce media data based on said updating scene information.

[Claim 18] The playback approach according to claim 17 characterized by generating the demand message of said updating scene information, and transmitting said message.

[Claim 19] Said updating scene information is the playback approach according to claim 17 or 18 characterized by being transmitted with the transmission system with which transmission of data is guaranteed.

[Claim 20] The 1st receiving means which receives the media data which are the regenerative apparatus of the contents data encoded in the multimedia coding format including the scene information for controlling the configuration of a scene, and constitute said contents data, The regenerative apparatus characterized by having the 2nd receiving means which receives the updating

scene information which shows the scene information by which said contents data were updated with a transmission system different from said media data, and a playback means to reproduce said media data based on said updating scene information.

[Claim 21] The regenerative apparatus according to claim 20 characterized by having a transmitting means to generate the demand message of said updating scene information, and to transmit said message.

[Claim 22] Said updating scene information is a regenerative apparatus according to claim 20 or 21 characterized by being transmitted with the transmission system with which transmission of data is guaranteed.

[Claim 23] It is the storage which memorizes the control program of the data transmission unit of the contents data of a multimedia coding format including the scene information for controlling the configuration of a scene possible [computer read-out]. The generation module which generates the notice information of updating for said control program to detect the contents of updating which analyze said scene information and are planned, and notify that renewal of a scene is the input module of said scene information, The 1st transmission module which transmits said notice information of updating to an

external device before updating generating of a scene, The storage characterized by including the 2nd transmission module which transmits the updating scene information corresponding to said notice information of updating to said external device with a different transmission system from said notice information of updating before updating generating of a scene.

[Claim 24] It is the storage which memorizes the control program of the regenerative apparatus of the contents data encoded in the multimedia coding format including the scene information for controlling the configuration of a scene possible [computer read-out]. The 1st receiving module which receives the media data with which said control program constitutes said contents data, The transmitting module which generates the demand message of the updating scene information which shows the scene information by which said contents data were updated, and transmits said message, The storage characterized by including the 2nd receiving module which receives said updating scene information with a transmission system different from said media data, and the playback module which reproduces said media data based on said updating scene information.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] Especially this invention relates to transmission and regeneration of a multimedia coding method of contents data which are

transmitted using the transmission format which a data deficit may generate about a data transmission means, data forwarding equipment, and a regenerative apparatus.

[0002]

[Description of the Prior Art] It is single respectively and media contents, such as an image, voice, and a text, are not treated, but with diversification of information media, the above-mentioned contents are associated mutually and it treats as one compound contents, and generally the so-called multimedia contents which can be reproduced with regenerative apparatus, such as a personal computer, have also come to be seen, synchronizing each contents.

[0003] Moreover, the so-called website which can carry out now via the Internet and will actually perform a contents distribution service by the spread of the Internet in recent years if it is service in the range restricted very much, although there is constraint about amount of information, the transmission quality, etc. of media contents which the existing means of signal transduction, such as television and radio, have performed, and which can also transmit distribution is also appearing.

[0004] It has been examined and decided upon various specification for

expressing multimedia contents with a control function called synthetic actuation and cooperation actuation of media contents as a digital data format which can be distributed through a network that it should correspond to a demand of the time mentioned above.

[0005] ISO/IEC 14496-1-3 (MPEG-4) which is the International Standard of the multimedia coding format by international-standards-ized engine ISO/IEC JTC1 SC29 as a typical thing of the specification which satisfies the above-mentioned demand is mentioned.

[0006] MPEG-4 are dealt with as a body (object) which constitutes the scene which reproduces single media data, such as an image (video) and voice (audio), respectively, and they have the description of being the object base coding format of encoding according to an individual.

[0007] Moreover, in MPEG-4, in order to compound each object and to express one scene, the view of scene description is introduced. This is realized by having the information (scene descriptive information) which described the spatial attribute which indicates independently arrangement of the correlation of each object which constitutes a scene, and the object on a scene to be the coded data of the object itself, the time attribute which shows the timing which an object

appears or disappears. It can change now dynamically in the middle of a scene, for example, scene descriptive information can perform modification of the attribute of being as displaying an object from the scene middle **** [and], addition, and deletion. [moving the location of an object]

[0008] It is possible to compound the scene in which the attribute of an object was reflected in analyzing with reference to the information (object descriptor information) which describes the identifier (object descriptor) which performs correlation with the object information shown by scene descriptive information, and the coded data of the object itself at the time of playback in addition to this scene descriptive information.

[0009] Thus, in order to express the multimedia contents which consist of two or more objects, it is imperfect and information (henceforth, scene information) for controlling the scene configuration of multimedia contents, such as scene descriptive information and object descriptor information, is needed with data, such as an image and voice. By using scene information, the configuration of the scene which the implementer of contents meant for the first time can express now correctly.

[0010] Therefore, in MPEG-4, the coding format of scene descriptive information

or object descriptor information etc. is specified, and it has shown as the International Standard of the part about the scene configuration of multimedia contents.

[0011] on the other hand, the detail of the part in connection with communication link what kind of transmission format and procedure should be used when the data of the encoded multimedia contents are transmitted through a network -- current and Internet Engineering Task Force (IETF), in addition to this, examination is advanced in the economic organization etc.

[0012] In this examination activity, in order to deliver the coded data which used the Internet for the transmission system, some drafts are proposed by current. For example, draft of using RTP (Real-Time Transport Protocol) which is a protocol for performing a real-time transfer of the data specified by RFC1889 as a communications protocol (it Avaro(es), Basso(es) and Casner(s)) Civanlar, Gentric, Herpel, Lim, Perkins:RTP PayloadFormat for MPEG-4 Streams, Internet Engineering Task Force and Internet Draft etc. -- it is opened to the public.

[0013]

[Problem(s) to be Solved by the Invention] The above-mentioned RTP is the communications protocol widely used now by the contents distribution system

which performs the so-called streaming processing of reproducing serially, receiving contents data in a regenerative apparatus, and has the advantage of having the structure for stopping blurring of delivery delay or delivery time amount small.

[0014] On the other hand, since it is based on UDP (User Datagram Protocol) which is the protocol of a delivery a non-guaranteeing mold, it also has the demerit in which packet loss, a transmission error, etc. occur and some delivery data may be lost.

[0015] It has, when transmission is performed like this RTP by the method which an error may generate during transmission of data, and in MPEG-4, in order to give the resistance (Error resiliency) over a transmission error or information lack to a coding method in the fixed range, various devices are made.

[0016] When an error occurs about video data or audio data, it can reproduce correctly after the data delivered by the normal of consecutiveness of what the effect of being as a noise mixing **** [, and] may generate. [that the video under playback and a part of audio are skipped]

[0017] Thus, in the case of the video data of MPEG-4 format, or audio data, a cure which suppresses the effect by the error as much as possible is made, and

a big problem is generated in playback actuation.

[0018] However, if the deficit of data occurs about scene information, such as scene descriptive information and object descriptor information, the information on the object which constitutes a scene will no longer be acquired correctly, an object will be displayed in the unjust condition, or as it said that it was not displayed at all, the problem of causing abnormalities by synthetic processing of a scene will arise.

[0019] Moreover, to a display, this does not remain, because it is affected, but since it can become the cause which causes the behavior which is not expected in playback actuation, it has suggested possibility of leading to fatal problems, such as a system crash, depending on the case.

[0020] If existence of the packet which also distributes the information for constituting scenes, such as scene descriptive information and object descriptor information, by RTP as the 1st solution over the above-mentioned problem, and has not arrived by the receiving side is detected, how to require that a non-arrived packet should be resent can be considered.

[0021] In RTP, since it is specified that it sets a sequence number as the header information of a packet, it is possible by supervising this sequence number to

detect packet loss.

[0022] However, by this approach, since it is unreproducible until it gives a resending demand to a sending area and the resent packet arrives, after packet loss is discovered, the evil in which delay arises during playback comes out.

[0023] As scene information required for playback is continuously repeated and delivered as the 2nd solution, even if a packet loses, there may also be a method of reconfiguring data by receiving the packet which arrives again.

[0024] However, since it is unreproducible until it receives the packet which arrives 2nd henceforth even if it uses this approach, delay arises in playback like the 1st solution. Furthermore, by this approach, since it continues occupying the bandwidth of a circuit while continuing repeating and sending out scene information, the problem of pressing the band which the video distributed to coincidence and an audio use also arises.

[0025] As the 3rd solution, using the communications protocol of a delivery guarantee mold like TCP (Transmission Control Protocol), static data, such as scene descriptive information, object descriptor information, and a static image, have the system of acquiring beforehand, before playback of a scene is started (JP,2000-232632,A).

[0026] Although this approach has the outstanding point that the bandwidth which reconstruction of a scene can perform certainly and is occupied during playback of a scene can be stopped small When the playback time amount of a scene is long and an attribute change of an object is frequently made into a scene Since the overhead which acquires data becomes large, the viewer of contents has the trouble that it may be kept waiting when changing before playback of the first scene, or from a scene to another scene.

[0027] Moreover, since the following scene information is not acquired, it cannot respond to contents distribution as which real time nature which is distributed while editing to a live image is required, until playback of the scene described using scene information [finishing / acquisition] ends this approach.

[0028] Although especially the technical problem described so far was related with the scene descriptive information and object descriptor information in MPEG-4, the above-mentioned technical problem is a common technical problem in the similar coding method which is not the thing of a proper and describes multimedia to MPEG-4.

[0029] Moreover, although RTP is generally used on an UDP protocol, also when the similar communications protocol which delay and an error of delivery

like UDP may generate is used, it cannot be overemphasized that it is a common technical problem.

[0030] This invention is made in view of such a trouble, and aims at offering the data transmission approach, the data forwarding equipment, and the regenerative apparatus for distributing the multimedia contents described by MPEG-4 or the similar coding format so that playback can be ensured in the network environment which a transmission error may generate.

[0031] Moreover, this invention aims at offering the data transmission approach, the data forwarding equipment, and the regenerative apparatus which can suppress to the minimum that delay occurs like the 1st solution mentioned above at the time of playback.

[0032] Moreover, this invention aims at offering the data transmission approach, the data forwarding equipment, and the regenerative apparatus which can distribute contents certainly, without continuing occupying the bandwidth of a circuit like the 2nd solution mentioned above.

[0033] Moreover, this invention aims at offering the data transmission approach, the data forwarding equipment, and the regenerative apparatus which can distribute the contents as which the difficult real time nature is required, and can

suppress delay of distribution to the minimum with the 3rd solution mentioned above.

[0034]

[Means for Solving the Problem] The data-transmission approach concerning this invention for solve the above-mentioned technical problem be the transmission approach of the contents data encoded in a multimedia coding format including the scene information for control a scene configuration , and the contents of updating plan from said scene information detect , the notice information of updating which show renewal of a scene generate , and it carry out transmit said notice information of updating to an external device before updating generating of a scene as the description .

[0035] The data transmission unit concerning this invention is a data transmission unit of the contents data of a multimedia coding format including the scene information for controlling the configuration of a scene. Moreover, the input means of said scene information, It is characterized by having a generation means to generate the notice information of updating for detecting the contents of updating which analyze said scene information and are planned, and notifying renewal of a scene, and a transmission means to transmit said notice

information of updating to an external device before updating generating of a scene.

[0036] Moreover, the playback approach concerning this invention is the playback approach of the contents data encoded in the multimedia coding format including the scene information for controlling the configuration of a scene. Receive the media data which constitute said contents data, and a transmission system different from said media data receives the updating scene information which shows the scene information by which said contents data were updated. It is characterized by reproducing media data based on said updating scene information.

[0037] Moreover, the regenerative apparatus concerning this invention is a regenerative apparatus of the contents data encoded in the multimedia coding format including the scene information for controlling the configuration of a scene. The 1st receiving means which receives the media data which constitute said contents data, It is characterized by having the 2nd receiving means which receives the updating scene information which shows the scene information by which said contents data were updated with a transmission system different from said media data, and a playback means to reproduce said media data based on

said updating scene information.

[0038] The storage concerning this invention is a storage which memorizes the control program of the data transmission unit of the contents data of a multimedia coding format including the scene information for controlling the configuration of a scene possible [computer read-out]. Moreover, said control program The generation module which generates the notice information of updating for detecting the contents of updating which analyze said scene information and are planned, and notifying that renewal of a scene is the input module of said scene information, The 1st transmission module which transmits said notice information of updating to an external device before updating generating of a scene, It is characterized by including the 2nd transmission module which transmits the updating scene information corresponding to said notice information of updating to said external device with a different transmission system from said notice information of updating before updating generating of a scene.

[0039] Moreover, it is the storage which memorizes the control program of the regenerative apparatus of the contents data encoded in the multimedia coding format including the scene information for controlling the configuration of a

scene possible [computer read-out]. The 1st receiving module which receives the media data with which said control program constitutes said contents data, The transmitting module which generates the demand message of the updating scene information which shows the scene information by which said contents data were updated, and transmits said message, It is characterized by including the 2nd receiving module which receives said updating scene information with a transmission system different from said media data, and the playback module which reproduces said media data based on said updating scene information.

[0040]

[Embodiment of the Invention] The principle and practice of this invention are explained to a detail, referring to a drawing below.

[0041] Drawing 1 is drawing for explaining the whole this invention configuration.

[0042] In drawing 1 , data forwarding equipment 101 inputs the information (henceforth, scene information) for controlling the scene configuration of the multimedia contents of kinds, such as scene descriptive information and object descriptor information, in a multimedia coding format similar to MPEG-4 or this, and it has a means to send out to a network.

[0043] The scene information inputted may be beforehand saved in data

forwarding equipment 101 and the storage section physically equipped in the same equipment, and may be transmitted through a certain means of communications from different equipment. Moreover, it is inputted into data forwarding equipment 101, and the data sent out can also make an object scene information, the video data which constitutes a scene and audio data, or data other than other scene information.

[0044] A regenerative apparatus 102 receives the data of the contents which constitute scenes, such as scene information sent out through the network, and video data, audio data, from data forwarding equipment 101, and has a means to reconfigure a scene and to reproduce. Even if data other than scene information are sent out from data forwarding equipment 101, they may be transmitted by other data forwarding equipments or other means.

[0045] Data forwarding equipment 101 and a regenerative apparatus 102 have the transmission line 103 for exchanging data through a network, a transmission line 104, and a transmission line 105. In addition, with the network shown by drawing 1 , it considers as the environment where bidirectional data communication can be performed like the Internet.

[0046] A transmission line 103 is a communication path for delivering data using

the transmission approach which a transmission error, packet loss, etc. may generate, although it receives from data forwarding equipment 101 to a regenerative apparatus 102 and the effectiveness of transmission processing is good. A transmission line 103 is used in order to carry out streaming delivery of the data (real-time mold data) with which real time nature is demanded like the video played by the decided time-axis being interlocked with, or an audio.

[0047] A transmission line 104 shall use the transmission approach of a delivery guarantee mold that it is a communication path for a transmission line 105 to deliver data from a regenerative apparatus 102 from data forwarding equipment 101 to a regenerative apparatus 102 to data forwarding equipment 101, and delivery can be ensured although the effectiveness of transmission processing of both is not necessarily good. A transmission line 104 and a transmission line 105 are used in order for each to deliver the data which must not have lack.

[0048] In addition, the transmission approach of the delivery guarantee mold mentioned above does not necessarily mean using the communications protocol which was inherent in the delivery guarantee function like TCP. For example, as it said that control of resending if loss of data is detected was performed on the responsibility for each equipment, as long as the processing which avoids lack of

data with a certain gestalt is realizable, the communications protocol of a delivery a non-guaranteeing mold like UDP may be used.

[0049] The above-mentioned transmission line 103, a transmission line 104, and a transmission line 105 are notional communication paths for each to explain the flow of data transmission, and are not necessarily in agreement with a physical circuit or a logical circuit, such as a session. Therefore, what kind of gestalt is taken and these transmission lines may be realized, even if it dissociates physically or logically and is the same.

[0050] Moreover, a transmission line 103, a transmission line 104, and a transmission line 105 are transmission lines needed at worst, in order to realize this invention, and in order to complement the function of this invention, they can also add other transmission lines.

[0051] When modification joins scene information, data forwarding equipment 101 sends beforehand the data (notice information of updating) which notify that a certain updating occurs on a scene to a regenerative apparatus 102 after this, before a scene actually changes.

[0052] A regenerative apparatus 102 will perform the data exchange in the procedure of emitting the message (demand message) which requires scene

information by the means of communications of a delivery guarantee mold to data forwarding equipment 101, and receiving the scene information on the scene updated (updating scene information), if modification of a scene is detected from the received notice information of updating.

[0053] It makes it possible to transmit suppressing small possibility that delay of playback will produce certainly the scene information which changes dynamically by taking such a procedure, as much as possible.

[0054] It explains being exchanged in data how by the above-mentioned procedure to a detail by the following.

[0055] Drawing 2 is drawing showing the DS of the notice information of updating.

[0056] In drawing 2 , the notice information 201 of updating is DS which consists of the updating specifier 202, the auxiliary-data length 203, and three data block of an auxiliary data 204.

[0057] The updating specifier 202 is a field holding the fixed-length binary data for specifying that updating occurs as scene information. When scene information is updated, it expresses that updating occurs by changing the value of the updating specifier 202. Although it depends on each gestalt of operation

for the contents of the value set as the updating specifier 202, the sequence number which begins from any value, or the clock value which shows the timing from which a scene changes is available.

[0058] When using a sequence number, it is required that only 1 should add the value of the updating specifier 202 to the timing which notifies that scene information is changed into data forwarding equipment 101, and the notice information 201 of updating should be sent out. Henceforth, data forwarding equipment 101 sends out the notice information 201 of updating, without making a change of the value of the updating specifier 202 until it performs the next notice of updating.

[0059] When using a clock value, the clock value which shows the timing by which the scene updated is actually reproduced is set up at the time of modification of the updating specifier 202 with which data forwarding equipment 101 is shown in the example of the above-mentioned sequence number.

[0060] A regenerative apparatus 102 performs the comparison with the value of the updating specifier 202 of the notice information 201 of updating that it arrived with reference to the value of the updating specifier 202 from the notice information 201 of updating that it arrived until now. Consequently, when it is a

different value, updating can be interpreted as occurring to scene information.

[0061] A regenerative apparatus 102 becomes possible [knowing that scene information will be updated as mentioned above with the updating specifier 202].

[0062] The auxiliary-data length 203 is a field holding the numeric value of the fixed length who shows the data size of the auxiliary data 204 mentioned later.

[0063] An auxiliary data 204 is a field for holding the additional data which need to be included and sent out to the notice information 201 of updating, and can hold the variable-length data of an arbitration format.

[0064] Although just the updating specifier 202 is enough as the data which the notice information 201 of updating should have if the purpose of notifying renewal of scene information is only achieved, the information about where the information about the scene updated is acquired from how is also needed separately. An auxiliary data 204 can be used in order to deliver the information for supporting such data acquisition processing.

[0065] For example, in order to tell a regenerative apparatus about the acquisition place of the scene information data updated, the use gestalt of setting URL of the data acquisition point as an auxiliary data 204, and sending it is assumed.

[0066] Or it can use also for the purpose of setting the information which becomes useful in order to compute acquisition timing of data, such as data size of the scene information updated, and an anticipation duration for acquiring data, as an auxiliary data 204, and sending it.

[0067] In addition, the contents and the format of data which are set as an auxiliary data 204 presuppose that the convention by this invention is out of range as a thing depending on each gestalt of operation.

[0068] Drawing 3 is drawing showing the structure of a data packet including the notice information of updating sent out from data forwarding equipment.

[0069] As shown in drawing 3 (a), the notice information 201 of updating is arranged between the transmit data 302 used as the packet header information 301 used for delivery control of the packet in the communications protocol to be used, and the payload of a packet.

[0070] Although the case (refer to drawing 3 (c)) where it carries out to a part of packet header can be considered as a gestalt in the case of mapping the notice information 201 of updating in a data packet when carrying out to a part of payload (refer to drawing 3 (b)), in this invention, it is very possible in which gestalt.

[0071] However, arrangement of the DS shown by drawing 3 does not necessarily need to become as in drawing.

[0072] Since the duplication of data is lost to the data item sent with the packet header information 301 in drawing 3 , and transmit data 302, the size of transmission data is reduced to it and communications processing is optimized when the item which can be used for the same purpose as each data block of the notice information 201 of updating is already defined, mapping of data block may be changed into it.

[0073] Next, data explain how it is exchanged between data forwarding equipment 101 and a regenerative apparatus 102.

[0074] Drawing 4 is drawing showing the transmission gestalt of the data exchanged between data forwarding equipment and a regenerative apparatus, and the timing by which each data is processed.

[0075] In drawing 4 , the data exchanged through a transmission line 103, a transmission line 104, and a transmission line 105 (refer to drawing 1) are expressed with a rectangle, and the timing by which, as for left part, transmission was started, the timing to which transmission completed the right-hand side, the surface, and a base show the duration concerning transmission.

[0076] The rectangles 401, 402, 403, and 404 in drawing 4 show the data of the notice information of updating delivered through a transmission line 103. It means being sent out repeatedly until each of such notice information of updating shows renewal of the same scene and the data of the same contents result [from 401] in 404.

[0077] The broken line TX which touches the left part of a rectangle 401 shows the timing which starts sending out of data. The broken lines TU1, TU2, TU3, and TUn which touch the rectangular right-hand side show the timing which transmission of the notice information data of updating corresponding to the notice information 401, 402, 403, and 404 of updating completed, respectively.

[0078] A rectangle 405 shows the message (demand message) which requires sending of the scene information data which are delivered through a transmission line 104, and which are updated. The broken line TRe which the broken line TRs which touches the left part of a rectangle 405 shows the timing by which transmission of a demand message is started, and touches the left part of a rectangle 405 shows the timing which transmission of a demand message completes.

[0079] A rectangle 406 shows the data (updating scene information data) of the

scene information which is delivered through a transmission line 105 and which is updated. The broken line TDe which the broken line TDs which touches the left part of a rectangle 406 shows the timing by which transmission of updating scene information data is started, and touches the left part of a rectangle 406 shows the timing which transmission of updating scene information data completes.

[0080] In addition, the transmission time of the data for checking whether deliveries, such as a notice (ACK) of arrival of the mail, have been performed correctly is also contained in the transmission duration of the data expressed with a rectangle 405 and a rectangle 406.

[0081] A broken line TS shows the timing which the synchronous processing for reproducing the delivered updating scene information data completes. Moreover, a broken line TP shows the timing by which the scene shown with the delivered updating scene information data is reproduced with a regenerative apparatus 102.

[0082] A regenerative apparatus 102 shows the flow that drawing 4 sends out the demand message 405 and receives the updating scene information data 406 from data forwarding equipment 101 after receiving the notice information 404 of

updating. That is, (TRs-TUn) corresponds to the duration of synchronous processing for (TDs-TRe) to reproduce the updating scene information data [in / for the duration of the sending-out preliminary treatment of the updating scene information data / in / for the duration of the sending-out preliminary treatment of the demand message 405 in a regenerative apparatus 102 / data forwarding equipment 101 / 406 / in (TS-TDe) / data forwarding equipment 101] 406.

[0083] The notice information of updating sent from data forwarding equipment 101 is sent using a transmission line 103 so that renewal of a scene can be told promptly. Since data may be missing when transmitting data in a transmission line 103, multiple-times continuation is carried out and the notice information of updating must be sent out, as shown in drawing 4 . However, the notice information of updating has only data required in order to tell renewal of scene information, but since data size is very small, even if repeat sending out is carried out, a network band pulse duty factor can be stopped few.

[0084] A regenerative apparatus 102 will transmit the demand message of the scene information data matched with the notice information of updating through the transmission line 104 to data forwarding equipment 101, if it detects that a scene is changed from the notice information of updating. Data forwarding

equipment 101 sends updating scene information data to a regenerative apparatus 102 through a transmission line 105 according to the demand message which received. Since it is sent in the transmission line of a delivery guarantee mold, a demand message and updating scene information data can be delivered certainly.

[0085] In performing the above-mentioned data-exchange processing, before the change of a scene actually occurs, data forwarding equipment 101 needs to send out data so that a regenerative apparatus 102 can prepare updating scene information data. That is, it is required that each data which data forwarding equipment 101 and a regenerative apparatus 102 send out should be sent out to the timing which fills the conditional expression shown in drawing 4 .

[0086] The term TUn of conditional expression shows the completion time amount of transmission of the last data of the notice information data of updating by which two or more transfer appearance is carried out from data forwarding equipment 101. Thus, sending-out timing needs to be computed based on the condition that the terms of delivery of the notice information data of updating are the worst.

[0087] Moreover, each term of (TUn-TX) of conditional expression, (TRs-TUn),

(TDs-TRe), (TDe-TDs), and (TS-TDe) may be changed according to factors, such as the data size of updating scene information, the data size of the notice packet of updating and a count of sending out, anticipation data size of a demand message, an anticipation duration of delivery check control processing, network transmission capacity, and a throughput of each equipment.

[0088] Therefore, [whether in the case of data forwarding, it sends out by giving sufficient time allowances for extent which is enough for a scene change even if delivery delay etc. occurs, and] By exchanging the statistical information about delivery capacity suitably between sending-out equipment 101 and a regenerative apparatus 102 using a communications protocol or equivalent means-of-communications data, such as RTCP (RTP Control Protocol) The trial calculation of the duration of the data exchange in a sending-out time is made, and performing processing in which sending-out timing is controlled is called for.

[0089] Next, the procedure performed for the data exchange is illustrated in data forwarding equipment 101 and a regenerative apparatus 102.

[0090] Drawing 5 is drawing showing the internal configuration of the data forwarding equipment of this invention, and a regenerative apparatus, and it is used in order to explain the procedure inside each equipment.

[0091] In drawing 5 data forwarding equipment 101 Acquisition and analysis of scene descriptive data, The communications control section 502 which performs the interpretation of the timing control of the data exchange with the data-processing section 501 which manages, and a regenerative apparatus 102, and a demand message, and a transmission line 103 are minded. The real-time mold data forwarding section 503 and the transmission line 104 which send out the data which need a real-time operation are minded. It consists of a message receive section 504 which receives the message sent from a regenerative apparatus 102, and the delivery guarantee mold data forwarding section 505 to which positive delivery sends out required data through a transmission line 105.

[0092] Moreover, the regenerative apparatus 102 The real-time mold data receive section 506 which receives real-time mold data through a transmission line 103 or other transmission lines, and a transmission line 104 are minded. The messaging section 507 which transmits a message to data forwarding equipment 101, and a transmission line 105 are minded. The communications control section 509 which performs timing control of the data exchange with the delivery guarantee mold data receive section 508 which receives data to be delivered certain, and sending-out equipment 101, and generation of a demand

message and scene information data, and the data of other type are unified. It consists of the synchronous-control sections 510 which perform control processing for making it synchronize. In addition, although not indicated by drawing 5 , a regenerative apparatus 102 shall have the regeneration section which performs the composition and playback of data which were received.

[0093] Drawing 6 is a flow Fig. for explaining cooperation actuation of each configuration section of data forwarding equipment 101 and a regenerative apparatus 102. An axis of ordinate corresponds to each configuration section in drawing 5 , and it is shown that each processing is performed from a top to the bottom in order of time series.

[0094] In drawing 5 and drawing 6 , the arrow head expresses the data between each configuration section, and the flow of a processing demand.

[0095] The arrow head shown with a broken line shows the data flow exchanged in order to offer the delivery guarantee of the data exchanged through a transmission line 104 and a transmission line 105. This data is equivalent to the confirmation-of-receipt packet in TCP, and it is exchanged in order to check that data have been delivered normally. In addition, in the text, the detail explanation about delivery control processing of delivery guarantee mold data is-omitted.

[0096] Hereafter, each procedure shown in drawing 6 is explained in order of time series.

[0097] : (Step 01) The data-processing section 501 acquires the scene information data of the contents for distribution. When scene information is multiplexed with the other type data which constitute contents and is recorded, processing which separates scene information is performed. The multimedia data (media data) which constitute scenes other than scene information data, such as video data and audio data, may be processed in the data-processing section 501.

[0098] : (Step 02) The data-processing section 501 predicts scene information acquired at step 01, and analyzes whether renewal of a certain scene information is planned, such as a change of a scene, an appearance of an object, disappearance, and attribute modification. When renewal of scene information is detected, renewal of scene information extracts the data in which the contents of updating of the scene information in the timing (playback timing) reflected in a playback scene and this timing are shown. Playback timing corresponds to TP of drawing 4 . To coincidence, the new updating specifier corresponding to updating scene information is generated. If updating is not detected, return and

the scene information on consecutive are acquired to step 01.

[0099] : (Step 03) The data-processing section 501 delivers the information (reference information) for referring to the extracted updating specifier, playback timing, and related updating scene information data as information for notifying the contents of updating extracted at step 02 to the communications control section 502. Although it is data used in order that reference information may acquire the updating scene information data managed in the data-processing section 501 and contents and a format change with management methods of updating scene information data, it is thought that the key data for searching updating scene information data from an internal table, a name, URL of a data file, etc. are used. It is also possible to use an updating specifier as reference information. The data-processing section 501 may divert an above-mentioned path, and may deliver media data to the communications control section 502.

[0100] : (Step 04) The communications control section 502 computes the timing (sending-out timing) which sends out the notice information of updating received and passed at step 03 so that the conditional expression shown by drawing 4 may be filled. Sending-out timing is equivalent to the timing which subtracted the duration of the data transmission processing shown by total of the fluctuation

item of conditional expression from playback timing, and corresponds to TX of drawing 4 .

[0101] (Step 05) :communications control section 502 reorganizes the notice information of updating received and passed at step 03 in the format shown in drawing 2 , and directs to send out by delivering the notice information of updating to the real-time mold data forwarding section 503, when the sending-out timing computed at step 04 comes. The communications control section 502 may divert an above-mentioned path, and may deliver media data to the real-time mold data forwarding section 503.

[0102] : (Step 06) The real-time mold data forwarding section 503 generates the data packet which mapped the notice information of updating with the layout shown in drawing 3 , and sends it out to a regenerative apparatus 102 through a transmission line 103. In a transmission line 103, since the delivery guarantee of data is not offered, the real-time mold data forwarding section 503 carries out multiple-times continuation, and performs sending out of a data packet. Similarly, the real-time mold data forwarding section 503 may send out media data to scene information and coincidence through a transmission line 103.

[0103] : (Step 07) The real-time mold data receive section 506 receives a data

packet through a transmission line 103, extracts the notice information of updating mapped by the packet, and delivers to the communications control section 509. The communications control section 509 may receive media data from the data forwarding section 101 or one of sending-out means, and may deliver them to the communications control section 509.

[0104] : (Step 08) The communications control section 509 computes the timing (demand timing) which sends out the demand message of updating scene information to data forwarding equipment 101 so that the conditional expression shown by drawing 4 may be filled. Demand timing corresponds to TRs of drawing 4 .

[0105] (Step 09) :communications control section 509 generates the demand message of updating scene information based on the contents of the notice information of updating, and directs to send out by delivering a demand message to the messaging section 507, when the demand timing computed at step 08 comes. In case updating scene information is acquired in the below-mentioned step 12, since the candidate for acquisition is specified, the reference information explained at step 03 must be contained in the demand message.

[0106] : (Step 10) The messaging section 507 sends out the demand message received and passed at step 09 through a transmission line 104 to data forwarding equipment 101. Since delivery of data is guaranteed in a transmission line 104, sending out of a demand message is performed once.

[0107] : (Step 11) The message receive section 504 receives a demand message through a transmission line 104, and delivers to the communications control section 502.

[0108] : (Step 12) The communications control section 502 requires the updating scene information data shown by the demand message received and passed at step 11 from the data-processing section 501. The updating scene information which serves as a candidate for acquisition here can be specified by the reference information of a demand message.

[0109] : (Step 13) The data-processing section 501 delivers the data of the updating scene information demanded at step 12 to the communications control section 502. Although it assumes that updating scene information contains the data which specify the playback timing of the scene, when playback timing is not contained, it is necessary to deliver separately.

[0110] (Step 14) :communications control section 502 directs to send out by

delivering the updating scene information data received and passed at step 13 to the delivery guarantee mold data forwarding section 505.

[0111] : (Step 15) The delivery guarantee mold data forwarding section 505 sends out the updating scene information data received and passed at step 14 to a regenerative apparatus 102 through a transmission line 105. Since delivery of data is guaranteed in a transmission line 105, sending out of updating scene information data is performed once.

[0112] : (Step 16) The delivery guarantee mold data receive section 508 receives updating scene information data through a transmission line 105, and delivers to the communications control section 509.

[0113] : (Step 17) The communications control section 509 delivers the updating scene information data received and passed at step 16 to the synchronusr-control section 510. In this processing, if required, the communications control section 509 will perform processing reorganized in the format that the synchronusr-control section 510 can interpret updating scene information data. The communications control section 509 is delivered to the synchronusr-control section 510 like updating scene information data, when media data are inputted...

[0114] : (Step 18) The synchronouser-control section 510 performs processing synchronized with the playback timing of data of other type, such as media data, with reference to playback timing from the updating scene information data received and passed at step 17. About the detail of synchronous processing, explanation is omitted as what is defined by the specification of the contents to reproduce. In addition, in synchronous processing, when it is detected that distribution of updating scene information is behind, the synchronouser-control section 510 can also perform processing which notifies generating of delay to the communications control section 509. In this case, it is expected that the communications control section 509 will reset the parameter for computing the sending-out timing of data according to the generating situation of delay, and processing for reducing generating of delay will be performed.

[0115] : (Step 19) The synchronouser-control section 510 delivers updating scene information, media data required for the playback inputted, etc. to the regeneration section, when playback timing comes.

[0116] As supplementary information of the above-mentioned processing, in step 02, the renewal of scene information is generated how, and the extracted updating scene information is managed how, or uses and illustrates drawing

below.

[0117] Drawing 7 is the image Fig. (drawing 7 (a)) of the scene expressed by the multimedia data distributed in this invention, and drawing (drawing 7 (b)) showing the playback schedule of each object which constitutes a scene.

[0118] In drawing 7 (a), it is shown that the scene 601 reproduced consists of the video object 602, an audio object 603, an image object 604, and a user interface object 605.

[0119] It shall be described by scene information that each object is reproduced in the scenario shown to the playback schedule shown in drawing 7 (b). In a playback schedule, the video object 602 and the audio object 603 are continuously reproduced through the scene 601 whole. The image object 604 appears to the timing T11 in the middle of scene 601, and an indication is not given, but although the user interface object 605 recognizes existence from the beginning of a scene 601, a display attribute is changed so that it may become non-display by a display and the timing of T22 to the timing of T21.

[0120] In order to extract updating scene information from the scene information on a scene 601, the data-processing section 501 scans the whole playback schedule of 601 according to a time-axis by processing of step 02 mentioned

above. If a scan detects the playback timing T11, T21, and T22 of an updating object, the scene information data of a part in which the contents of updating corresponding to each timing are shown will be cut down from the scene information data of a scene 601.

[0121] Furthermore, it relates with the reference information of scene information, and the data-processing section 501 manages so that it can receive and pass according to a demand by processing of step 12 which mentioned the cut-down scene information data above.

[0122] When two or more updating continues for a short time like the playback timing T11 and T21 and it generates, the data-processing section 501 may perform processing in which unify two or more updating and it manages as one updating data. Since the count of the notice of updating can be decreased by performing this processing, the effectiveness that the total processing time concerning acquisition of updating data is compressed is expectable.

[0123] Next, the management method of the above-mentioned updating scene information data is explained using drawing 8 .

[0124] By drawing 8 , as an example of the management method of updating scene information, when holding the relation of an updating specifier and

updating scene information, and the managed table of the contents of data (drawing 8 (a)), two kinds of approaches in the case (drawing 8 (b)) of carrying out the file output of the updating scene information data are shown.

[0125] Drawing 8 (a) shows that the data-processing section 501 manages using the updating scene information management table 701 for defining the relation of updating scene information and reference information. The updating scene information management table 701 shall be held on the memory of the data-processing section 501 as internal information of the data-processing section 501.

[0126] The updating scene information data whose updating scene information management table 701 corresponds with the reference information which searched the updating scene information management table 701 when the data-processing section 501 received a demand of updating scene information by having managed the set of the reference information which corresponds with updating scene information data at drawing so that it may be shown, and was specified are specified.

[0127] In this case, the data of an arbitration format can be used for reference information. For example, as reference information, as an updating specifier is

used, it is also possible to attain simplification of the data item to manage and the notice data of updating, and to increase the efficiency of processing.

[0128] Drawing 8 (b) shows that the data-processing section 501 outputs updating scene information data as a file, and manages them by file format in data forwarding equipment.

[0129] In this case, as a file name is used as reference information of updating scene information data, the data-processing section 501 specifies updating scene information data from the specified file name.

[0130] The data-processing section 501 shall manage updating scene information data with which means, such as an approach mentioned above.

[0131] In the above, the principle and practice of this invention have been explained.

[0132] Then, the gestalt of concrete operation of this invention realized based on an above-mentioned practice is explained.

[0133] <Gestalt 1 of operation> drawing 9 is drawing showing a configuration in case the scene information data saved beforehand at the store, video data, and audio data are sent out from the same data forwarding equipment as a gestalt 1 of operation of this invention.

[0134] In drawing 9 , a store 801 keeps various data, such as video data which constitutes the multimedia contents distributed to a regenerative apparatus 102 from data forwarding equipment 101, audio data, and scene information, and has a means to memorize.

[0135] Two record gestalten in the case of being recorded as single data with which the record format [multimedia contents] which can collect [the case where the component is recorded in the condition of having become independent, respectively and of having dissociated as data, and] two or more different-species media data multiplexed are assumed. Some formats, such as a data-logging format (henceforth, QuickTime format) in the expansion "QuickTime" for treating the multimedia which U.S. Apple Computer, Inc. offers, for example as a record format which makes the latter gestalt possible, serve as an industry standard, and, generally it is thought that it is available.

[0136] Storage 801 may memorize with which the above-mentioned gestalt.

[0137] Data forwarding equipment 101, a regenerative apparatus 102, a transmission line 103, a transmission line 104, and a transmission line 105 apply to explanation of drawing 1 .

[0138] In the gestalt 1 of operation, data forwarding equipment 101 acquires the

data of the multimedia contents memorized by the store 801 using a certain transmission means, and performs data distribution to a regenerative apparatus 102 according to the procedure shown by drawing 6 .

[0139] This gestalt is characterized by distributing the notice information of updating, and other media data from the same data forwarding equipment through a transmission line 103. Therefore, this gestalt can be applied, when carrying out overconcentration management of each data is called for, or when contents data are recorded by record formats, such as a QuickTime format, as single data.

[0140] The notice information of updating and other media data are sent out to a transmission line 103 in step 04 of drawing 6 . The data sent out here are sent out to a transmission line 103 with what kind of gestalt, or supplementary information of the drawing is used and carried out to below.

[0141] Drawing 11 is drawing for explaining the transmission gestalt in the case of sending using the communication channel which became independent according to the data type, in case data forwarding equipment sends out data. Moreover, drawing 12 is drawing for explaining the transmission gestalt in the case of sending the multiplexed data by the single communication channel, in

case data forwarding equipment sends out data.

[0142] In addition, the above-mentioned communication channel shows logical connection for each equipment to perform an internetwork communication link, and means the channel on mounting equivalent to the socket connection in TCP. Therefore, it is distinguished from the transmission line which is the expression for explaining the notional exchange means of data in this invention.

[0143] In drawing 11 and drawing 12 , the data packet sent out from data forwarding equipment 101 to a transmission line 103 is expressed with a rectangle, and, as for rectangular width of face, a data packet shows the timing sent out in a communication channel, as for arrangement of the size of a data packet, and a rectangle.

[0144] Drawing 11 shows signs that the data packet of the notice information of updating, the video-data packet, and the audio data packet are sent out by the respectively different communication channel. In addition, each notice information of updating shown by drawing 11 notifies the same contents, and it means that resending of a packet is performed for the improvement in resistance to data lack.

[0145] As shown in drawing 11 , the data flow (stream) which consists of a

sequence of a packet is sent out to a communication channel, but when a respectively different communication channel sends out video data, audio data, and the notice information data of updating like drawing 11 , the gestalt of sending out multiplexes video data, audio data, and the notice information data of updating to one stream like drawing 12 , and can consider two kinds with the case where a single communication channel sends out.

[0146] It is also possible to send out data with which gestalt in the gestalt 1 of operation.

[0147] <Gestalt 2 of operation> drawing 10 is drawing showing the configuration in the case of being sent out from the data forwarding equipment with which the scene information data saved beforehand at the store differ from other data as a gestalt 2 of operation of this invention.

[0148] In drawing 10 , data forwarding equipment 901 is equipment for sending out the media data except scene information among the data which constitute multimedia contents, and has a sending-out means equivalent to data forwarding equipment 101.

[0149] A store 801 keeps the scene information data of multimedia contents sent out by data forwarding equipment 101, and has a means to memorize.

[0150] A store 902 is equipment which keeps and records the media data except the scene information sent out by data forwarding equipment 901, and has a storage means equivalent to a store 801.

[0151] A transmission line 903 is the 2nd real-time mold data transmission line for delivering the media data except scene information from data forwarding equipment 901 to a regenerative apparatus 102, and is realized using the transmission approach equivalent to a transmission line 103.

[0152] Data forwarding equipment 101, a regenerative apparatus 102, a transmission line 103, a transmission line 104, and a transmission line 105 apply to explanation of drawing 1 . Moreover, storage 801 applies to explanation of drawing 9 .

[0153] In the gestalt 2 of operation, data forwarding equipment 101 acquires the scene information data memorized by the store 801 using a certain transmission means, and performs data distribution to a regenerative apparatus 102 according to the procedure shown by drawing 6 . In addition, data forwarding equipment 901 acquires the media data memorized by the store 802 using a certain transmission means, and distributes them to a regenerative apparatus 102 using a transmission line 903. A regenerative apparatus 102 performs the

synchronous control of the media data sent from data forwarding equipment 901 as processing of step 18 of drawing 6 based on the scene information sent from data forwarding equipment 101.

[0154] This gestalt is characterized by distributing in asynchronous through a different transmission line from two or more data forwarding equipments which do not have means of communications mutually when the notice information of updating and other media data which constitute multimedia contents are kept in the condition of having dissociated physically. This gestalt like [in the case of adding scene description to the media data distributed from the existing site] When it is difficult to manage media data and scene information physically in the same location, on the movie which can perform the title display of two or more language When it is desirable to make processing top data separate, it can apply, as an image, voice data, and the title section data of the word of each country are made to separate and it manages to another site, in order to optimize the data size to keep.

[0155] Since two or more transmission lines are used for delivery of data with the gestalt 2 of operation, as drawing 12 shows, it is impossible to multiplex data and to send out as a single stream. Therefore, sending out of data multiplexes data

for every transmission line which performs by the approach of using a different communication channel for every data type, or is used, as drawing 11 shows, and it must be made to have to treat them as two or more multiplexing streams.

[0156] In addition, in the gestalt 2 of above-mentioned operation, with data forwarding equipment 101, although data forwarding equipment 901 explains scene information as what sends out other media data, data forwarding equipment 101 may send out the media data other than scene information. Moreover, in addition to data forwarding equipment 901, media data may be sent out from the 3rd and 4th data forwarding equipment.

[0157] However, it is desirable for it to be managed with a specific store and data forwarding equipment, and to be sent out about scene information data, in a specific transmission line. If delivery of the information over the same scene is permitted through two or more transmission lines, since the means solved when conflict occurs between the scene information sent out in each transmission line does not exist, possibility of saying that it becomes impossible to reproduce correctly arises. Therefore, although it is good for two or more same scene information to exist, it should not distribute to coincidence through two or more transmission lines to the same regenerative apparatus.

[0158] <Gestalt 3 of operation> drawing 13 is drawing showing the configuration in the case of changing into a refreshable format the data distributed from data forwarding equipment with a regenerative-apparatus simple substance as a gestalt 3 of operation of this invention, and outputting and inputting to a recording device.

[0159] In drawing 13 , a recording apparatus 1001 is equipment for a regenerative apparatus 102 to record the data of multimedia contents in a refreshable format, and has a transmission means for performing the data exchange between regenerative apparatus 102.

[0160] Data forwarding equipment 101, a regenerative apparatus 102, a transmission line 103, a transmission line 104, and a transmission line 105 apply to explanation of drawing 1 .

[0161] The gestalt 3 of operation shows the gestalt in the case of delivering the data received with the regenerative apparatus 102 not to the regeneration section but to other recording devices. This gestalt is applied when realizing a recording device like a hard disk recorder using the principle of this invention.

[0162] In the gestalt 3 of operation, a regenerative apparatus 102 delivers the configuration data of the contents which received after processing of step 17 of

drawing 6 to a recording device 1001. As long as it is required in that case, processing which changes data into the format suitable for management with a recording device 1001 may be performed. When reproducing the data of the recorded contents, a regenerative apparatus 102 acquires the data of the contents reproduced from a recording apparatus 1001, and processes consecutiveness just before processing of step 18 in drawing 6 .

[0163] In addition, the equipment configuration for realizing this gestalt is not limited to the configuration shown in drawing 13 . As shown by drawing 12 , even when receiving contents data from two or more data forwarding equipments, the function of this gestalt is realized.

[0164] <Gestalt 4 of operation> drawing 14 is drawing showing the configuration when not sending out the demand message of updating scene information which receives from a regenerative apparatus to data forwarding equipment as a gestalt 4 of operation of this invention.

[0165] Data forwarding equipment 101, a regenerative apparatus 102, a transmission line 103, and a transmission line 105 apply to explanation of drawing 1 .

[0166] Unlike the gestalt of other operations, with the gestalt 4 of operation, it

does not have a transmission line 104 between data forwarding equipment 101 and a regenerative apparatus 102. Therefore, with this gestalt, since the processing time concerning the demand message switching from the regenerative apparatus 102 to data forwarding equipment 101 becomes unnecessary, the effectiveness that the total processing time until distribution of scene information is completed is shortened is expectable.

[0167] However, in order to realize this gestalt, while playback of a scene is performed, it is a regenerative apparatus 102. The communication channel corresponding to a transmission line 105 must be secured between data forwarding equipment 101. This gestalt cannot be applied when the transmission approach which forms a communication channel is used, whenever it requires like HTTP as a means to transmit updating data.

[0168] In order to realize this gestalt, it is necessary for data forwarding equipment 101 to answer a demand message from a regenerative apparatus 102, and to perform processing called sending out in updating scene information in which do not carry out but data forwarding equipment distributes updating scene information to a regenerative apparatus 102 actively. Hereafter, the procedure which is needed in the gestalt 4 of operation is explained.

[0169] The timing which sends out updating scene information is determined by data forwarding equipment 101 with the gestalt 4 of operation. Therefore, the processing which computes the sending-out timing of updating scene information in the communications control section 502 after step 05 of drawing 6 is added.

[0170] Processing from consecutive step 08 to step 11 is not performed, but as processing of step 12, the communications control section 502 is the timing at which the sending-out timing of the computed updating scene information arrived, and acquires the data corresponding to the contents of updating which notified at step 05.

[0171] The processing after step 13 is as being shown in drawing 6 .

[0172] Furthermore, the conditional expression of the sending-out timing of the data shown in drawing 4 is changed as follows.

[0173]

Calculation processing of the sending-out timing of step 02 in $TX + (T_{Un} - TX) + (T_{Ds} - T_{Un}) + (T_{De} - T_{Ds}) + (T_S - T_{De}) < T_P$ drawing 6 , step 04, and the updating scene information added with this gestalt must compute timing according to the conditional expression after modification.

[0174] The gestalt 5 of the <gestalt 5 of operation> operation shows the gestalt in the case of distributing the contents to which edit of a scene was performed by edit equipment instance from data forwarding equipment. Instance, when realizing the distribution system of sexual high contents which can be seen by TV junction of adding news flash data to a live image etc., this gestalt is applied.

[0175] Drawing 15 is drawing showing the configuration in the case of editing the video data inputted into edit equipment, audio data, and scene descriptive data instance as a gestalt 5 of operation of this invention, and distributing instance from data forwarding equipment.

[0176] In drawing 15 , edit equipment 1101 has media entry-of-data means, such as video data and audio data, a scene information entry-of-data means, the edit means of scene information, and a means to transmit the edited scene information to data forwarding equipment 101.

[0177] With the edit means offered by edit equipment 1101, a scene editor shall update scene information. Edit equipment 1101 shall transmit the scene information updated by actuation immediately after performing editing operation instance to data forwarding equipment 101.

[0178] Data forwarding equipment 101, a regenerative apparatus 102, a

transmission line 103, a transmission line 104, and a transmission line 105 apply to explanation of drawing 1 .

[0179] Next, in order to explain the flow of updating data origination processing, an example of the editing task which an operator performs through edit equipment 1101 is shown.

[0180] Drawing 16 is drawing for explaining the editing operation performed on edit equipment.

[0181] Drawing 16 explains taking the case of the case where the application program which operates with a personal computer is used as an edit means with which edit equipment provides an operator.

[0182] In drawing 16 , the scene editor program 1201 shows the application program on the personal computer which offers the function for performing scene edit to an operator.

[0183] The scene editor program 1201 has a working area 1202, the updating carbon button 1203, and Cancel button 1204 as an interface for editing operation.

An operator shall perform an editing task by operating the above-mentioned interface using pointing devices, such as a mouse.

[0184] A working area 1202 is a field for performing a layout setup of the object

contained in a scene, to a working area 1202, it shall be operating paste or drag and drop, and a new object shall appear the data of an object in a working area 1202. The new object added by the above-mentioned actuation shall perform a setup of a location or size by operating it with a pointing device.

[0185] The updating carbon button 1203 is a carbon button for updating scene information according to the contents of edit. When the updating carbon button 1203 is pushed, the scene editor program 1201 decides the editing operation performed on the working area 1202, and makes the contents of edit reflect in scene information.

[0186] Cancel button 1204 is a carbon button for canceling updating. If Cancel button 1204 is pushed, a scene editor program shall be canceled without making the contents of the editing operation performed on the working area 1202 reflect in scene information.

[0187] A scene 601 is a scene of the object which performs editing operation on a working area 1202. The video object 602 which constitutes a scene 601, the audio object 603, the image object 604, and the user interface object 605 apply to explanation of drawing 7 (a).

[0188] Drawing 16 describes the procedure of performing actuation of adding the

image object 604 to a scene 601, as an example of editing operation. The broken-line arrow head expresses actuation of the pointing device for performing operating procedure.

[0189] A procedure (1) dragging and dropping the image object 604 to a working area 1202, and shows the actuation added on a scene 601.

[0190] A procedure (2) shows actuation of changing the size of an object, to the image object 604 on a working area 1202.

[0191] A procedure (3) clicks the updating carbon button 1203, and shows the actuation to which the contents of edit performed in the procedure (1) and the procedure (2) are made to reflect in a scene 601.

[0192] Edit equipment 1101 shall transmit the scene information data which expressed the contents of edit to data forwarding equipment 101 immediately after the actuation shown in the above-mentioned procedure. The transmitted scene information data are transmitted to a regenerative apparatus 102 through a transmission line 105 from data forwarding equipment 101.

[0193] Drawing 17 is drawing for explaining the transmission gestalt of the scene information data created by edit equipment, and the timing of editing operation and scene information data forwarding.

[0194] In drawing 17 , the scene information data sent out through a transmission line 105 from data forwarding equipment are expressed with a rectangle, and the timing by which, as for left part, sending out was started, the timing to which sending out completed the right-hand side, the surface, and a base show the duration concerning sending out.

[0195] The data for a display of the display position of the arranged image object 604, initial size, and the image object 604 are contained in the scene information data generated in the procedure (1) of expressing the data of the scene information generated in the procedure (1) of drawing 16 in which the rectangle in drawing 17 is sent out through a transmission line 105, the procedure (2), and the procedure (3). As for the scene information data generated in the procedure (2), the size after modification of the image object 604 is contained. the scene information data generated in the procedure (3) -- being alike -- validation/nullification message of the sent scene information is contained.

[0196] Broken lines TE1, TE2, and TE3 show the timing to which the procedure (1) of drawing 16 , the procedure (2), and the procedure (3) were performed, respectively. Broken-line TD1e which shows the timing by which sending out of scene information data was started at broken-line TD1s, TD2s, and TD3s which

touches the left part of each rectangle, and touches the right-hand side of each rectangle in it, TD2e, and TD3e show the timing which sending out of scene information data completed.

[0197] With the gestalt 5 of operation, by transmitting the contents under edit to a regenerative apparatus 102 serially from data forwarding equipment 101 using the principle of this invention shows the approach for minimizing time lag after editing operation is decided until transmission of scene information data is completed to a regenerative apparatus.

[0198] As shown in drawing 17 , in order to transmit the scene information data relevant to the image object 604 Total of the transmission time of data, Sum total time amount of total of time lag after actuation is performed by edit equipment until sending out is started $(TD1 \text{ second-TE1}) + (TD1 \text{ e-TD1s}) + (TD2 \text{ second-TE2}) + (TD2 \text{ e-TD2s}) + (TD3 \text{ second-TE3}) + (TD3 \text{ e-TD3s})$ It is alike and corresponding time amount is needed.

[0199] In this gestalt, data are sent by the flow of sending the message which confirms scene information which sends the contents of edit till then before performing definite actuation shown in a procedure (3), and was sent in the procedure (1) and the procedure (2) at the time of a procedure (3). According to

this approach, the data sent after decision of the contents of edit turn into only data of a procedure (3), and the time amount to the completion of transmission of the scene information data to a regenerative apparatus becomes $(TD3 \text{ second} - TE3) + (TD3 \text{ e} - TD3s)$ from decision of editing operation.

[0200] In addition, also when Cancel button 1204 is pushed and the contents of edit are canceled in a procedure (3), above-mentioned processing is applied. When the contents of edit cancel, the message which makes scene information an invalid as data of a procedure (3) is sent, and it is made to perform actuation of canceling the contents of the scene information data sent till then after reception of a message in a regenerative apparatus 102.

[0201] As mentioned above, the example of application of this invention in the case of distributing the scene information edited on edit equipment instance was shown.

[0202] In addition, it cannot be overemphasized by the purpose of this invention supplying the storage (or record medium) which recorded the program code of the software which realizes the function of the operation gestalt mentioned above to a system or equipment, and reading and performing the program code with which the computer (or CPU and MPU) of the system or equipment was

stored in the storage that it is attained. In this case, the function of the operation gestalt which the program code itself read from the storage mentioned above will be realized, and the storage which memorized that program code will constitute this invention. Moreover, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that the operating system (OS) which is working on a computer is actual, based on directions of the program code, and the function of the operation gestalt mentioned above by performing the program code which the computer read is not only realized, but was mentioned above by the processing is realized.

[0203] Furthermore, after the program code read from a storage is written in the memory with which the functional expansion unit connected to the functional expansion card inserted in the computer or a computer is equipped, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that CPU with which the functional expansion card and functional expansion unit are equipped based on directions of the program code is actual, and mentioned above by the processing is realized.

[0204] When applying this invention to the above-mentioned storage, the whole procedure explained previously or the program code corresponding to a part will be stored in the storage.

[0205]

[Effect of the Invention] As mentioned above, according to this invention, also in the network environment in which a transmission error may generate the multimedia contents described by MPEG-4 or the similar coding format, it becomes possible to distribute so that playback can be ensured, without scene information being missing.

[0206] Furthermore, according to this invention, a scene can be reproduced, suppressing reproductive delay or a reproductive halt to the minimum.

[0207] Furthermore, since according to this invention bandwidth of a circuit is not occupied in order to distribute scene information certainly, the amount of the total used of bandwidth can be controlled, without barring distribution of other media data.

[0208] Furthermore, even when edit is carried out to real time not only to the contents currently recorded beforehand but to a live image etc. according to this invention, contents can be distributed by the minimum delay.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing the whole this invention configuration.

[Drawing 2] It is drawing showing the DS of the notice information of updating.

[Drawing 3] When carrying out to a part of payload and carrying out to a part of (b) and packet header as the structure (a) of the data packet of the notice information of updating sent out from data forwarding equipment, and a gestalt of the mapping, it is drawing showing (c).

[Drawing 4] It is drawing showing the transmission gestalt of the data exchanged between data forwarding equipment and a regenerative apparatus, and the timing by which each data is processed.

[Drawing 5] It is drawing showing the internal configuration of the data forwarding equipment of this invention, and a regenerative apparatus.

[Drawing 6] It is a flow Fig. for explaining cooperation actuation of each configuration section of data forwarding equipment and a regenerative apparatus.

[Drawing 7] They are the image Fig. (a) of the scene expressed by the multimedia data distributed in this invention, and drawing (b) showing the playback schedule of each object which constitutes a scene.

[Drawing 8] When holding the relation of an updating specifier and updating scene information, and the managed table of the contents of data and carrying out the file output of (a) and the updating scene information data as a

management method of updating scene information, it is drawing for explaining (b).

[Drawing 9] It is drawing showing a configuration in case the scene information data saved beforehand at the store, video data, and audio data are sent out from the same data forwarding equipment as a gestalt 1 of operation of this invention.

[Drawing 10] It is drawing showing the configuration in the case of being sent out from the data forwarding equipment with which the scene information data saved beforehand at the store differ from other data as a gestalt 2 of operation of this invention.

[Drawing 11] In case data forwarding equipment sends out data, it is drawing for explaining the transmission gestalt in the case of sending using the communication channel which became independent according to the data type.

[Drawing 12] In case data forwarding equipment sends out data, it is drawing for explaining the transmission gestalt in the case of sending the multiplexed data by the single communication channel.

[Drawing 13] It is drawing showing the configuration in the case of changing into a refreshable format the data distributed from data forwarding equipment with a regenerative-apparatus simple substance as a gestalt 3 of operation of this

invention, and outputting and inputting to a recording device.

[Drawing 14] It is drawing showing the configuration when not sending out the demand message of updating scene information which receives from a regenerative apparatus to data forwarding equipment as a gestalt 4 of operation of this invention.

[Drawing 15] It is drawing showing the configuration in the case of editing the video data inputted into edit equipment, audio data, and scene descriptive data instance as a gestalt 5 of operation of this invention, and distributing instance from data forwarding equipment.

[Drawing 16] It is drawing for explaining the editing operation performed on edit equipment.

[Drawing 17] It is drawing for explaining the transmission gestalt of the scene information data created by edit equipment, and the timing of editing operation and scene information data forwarding.